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I. INTRODUCTION

For any country, when participating in the international trade system will need to consider very carefully the issue of tax rates for imported goods. It demonstrates the effect of protection for domestic products. Besides, the determination of competitive sectors and sectors with high level of dispersion to the economy needs to be very clear.

After five years of becoming an official member of the World Trade Organization (WTO), the questions for Vietnam are: How are the nominal rate of protection (NRP) and effective rate of protection (ERP); how are the impact and the dispersion on the most affected sectors of the protection of domestic products?

This paper is the expansion and updating from the research of Bui and Kobayashi (2011), it was studied on the economic structure of the I-O table 2007 and supply and use tables, 2010 (SUT 2010 update), and the actual nominal tax rate for the years 2005-2011.

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II. METHODOLOGY

a) Effective rate of protection (EPR)

Typically, the tax rate for imported goods is seen as the nominal protection for domestic products. So, a question to be considered is the effective protection for domestic production will be like? The choice of the tax rate for products so that the industries with high competitiveness and high power of dispersion in the economy remain protected at the level of efficiency.

Effective rate of protection show that the level of production's protection through import tax (nominal rate of protection – NRP), this coefficient is calculated by following formulas:

Where:

$$e_j = \frac{V(do)_j - V(fo)_j}{V(fo)_j}$$

$V(do)_j$ is the value added at domestic price in industry j

$V(fo)_j$ is the value added at world price in industry j

E_j is effective rate of protection of industry j

The comparison between the import multiplier, the power of dispersion on import and ERP in order to help the policy makers to define the key the economic sectors which having higher economic multiplier (more than 1) and lower power of dispersion on import (less than 1). This helps them to issue some appropriate import tariff policies that, at the same time, ensures the process of economic integration and the protection of domestic production.

b) The index of the power of dispersion and the index of power of dispersion on import

This research is based on Keynes' theory on the relationship's extension of trade that the Keynesian trade factors used to estimate the import demand in manufacturing for final demand. In reality, it led to the confusion because the domestic final demand often includes final consumptions, investment/saving and export. Input-Output table of Leontief was developed basing on Keynes' theory. An expansion of Keynesian in input-output table of Leontief developed base on each factor's impact of demand.

The Leontief system was estimated as Equation:

$$X - A.X = C + I + E - M \quad (1)$$

Where: X, C, E, I, M are the vectors of gross output, household consumption, gross capital formation, export and import respectively.

Equation (1) can be rewritten as follow:

$$X - A.X = C + I + E - M^p - M^c \quad (2)$$

Where: M^p is the import matrix of production (intermediate consumption), M^c is import for final demand and $M = M^p + M^c$.

Expanding Equation (2):

$$X - A^d.X - A^m.X = C^d + I^d + E + C^m + I^m - M \quad (3)$$

Of which: $A.X = A.X + A^m.X$

$$A^m.X = M^p$$

$$M^c = C^m + I^m$$

A^d is matrix of intermediate consumption of domestic products; C^d and I^d are the final consumption and gross capital formation vectors of domestic products, respectively.

Putting: $Y^d = C^d + I^d + E$, where Y^d denotes the final demand of domestic products vector, now we can rewrite the Equation (3) as follows:

$$X = (I - A^d)^{-1} . Y^d = (1 + A + A^2 + A^3 + \dots) Y^d \quad (4)$$

Where $(I - A^d)^{-1}$ is the Leontief matrix multiplier that shows domestic product requirements for a unit increase in domestic final demand.

A backward linkage can be computed from the Leontief's element matrix. This is an important relationship in the operation of the economy. This ratio was described by Rasmussen (1957) as the index of the power of dispersion μ_j , and is defined mathematically as follows:

$$\mu_j = \frac{\sum_{i=1}^n l_{ij}}{\frac{1}{n} \sum_{i=1}^n \sum_{j=1}^n l_{ij}}$$

l_{ij} is an element of Leontief's multiplier matrix.

Thus, we can see that this index of sector greater than 1 will affect domestic production more than another.

On the other hand, equation (3) can also be written:

$$X - A^m.X = A^d.X + C^d + I^d + E + C^m + I^m - M = TDD - M^p$$

Set the total domestic demand (including intermediate consumption, final consumption, investment and export) $TDD = A^d.X + C^d + I^d + E$, we obtain:

$$X = (I - A^m)^{-1} . (TDD - M^p) \quad (5)$$

Or: $X = (I - A^m)^{-1} . (TDD + C^m + I^m - M) \quad (6)$

Matrix $(I - A^m)^{-1}$ is the import multiplier matrix. Equations (5) and (6) present the demand of spread import by domestic demand.

Thus, The I-O table should be built as non-competitive import type. In Vietnam, the I-O table is only built as competitive import type. So, the existing input-output table for Vietnam should be mathematically changed to non-competitive import type. A^m and A^d are calculated as follows:

Where: $m_i = M_i / TDD_i$; M_i is imported good I and TDD_i is the total domestic demand of product I excluding export and $m_i < (or =) 1$

$$A^m X = F . A . X \text{ and } A^d X = (I - F) . A . X \quad (7)$$

F is the diagonal matrix of import coefficient (m_i).

M_c can be defined as: $M_c = (I - A^m)^{-1} . C^d$ is the import dispersion caused by final consumption. And:

$M_I = (I - A^m)^{-1} . I^p$ is the imported dispersion caused by domestic accumulation.

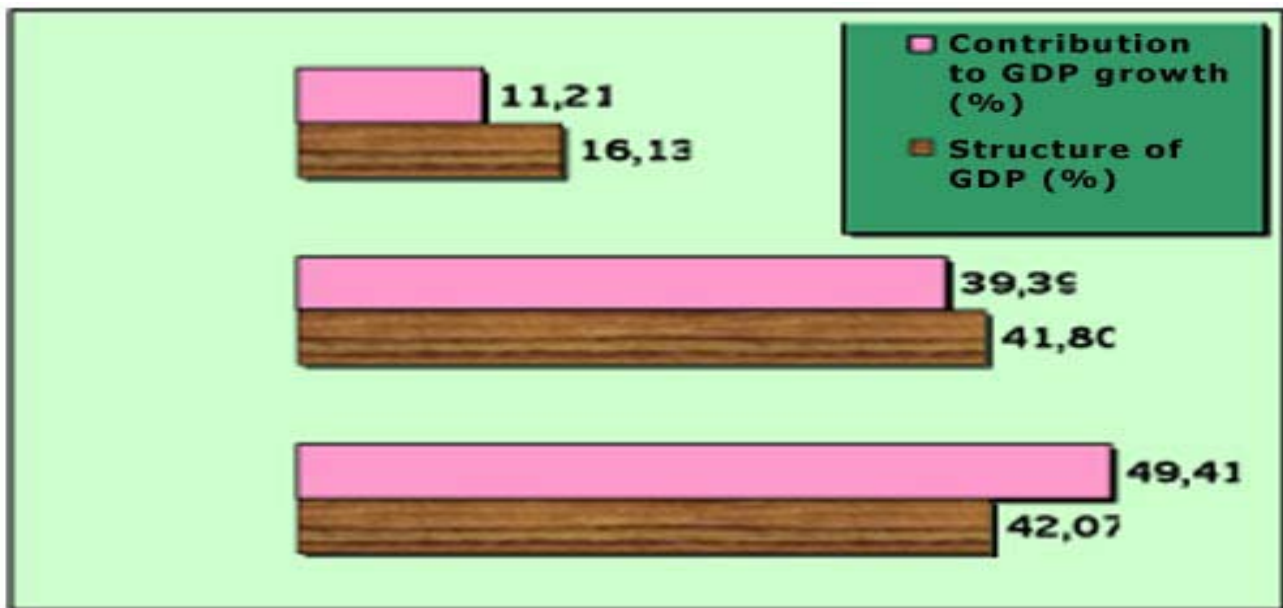
$M_E = (I - A^m)^{-1} . E$ is the imported dispersion caused by export.

III. RESEARCH RESULTS

a) Contribution of 3 Regions to the GDP Growth

According to the social and economic report of Vietnam by General Statistics Office of Vietnam, 2011's GDP was estimated growing 5.89%. Of which, the region I (agriculture, forestry and fishery) contributed 0.66 percent point; the region II (the industry and construction) contributed 2.32 percent points and the region III (service) contributed 2.91 percent points. However, in fact, the contribution of region I on the growth rate of GDP is still modest (11.21%) compared to the structure of contribution (16.13%) of this region in total GDP at 1994 constant prices (Figure 01).

Figure 01 : Structure of GDP & contribution of 3 regions to the GDP growth



b) ERP and NRP of Region I

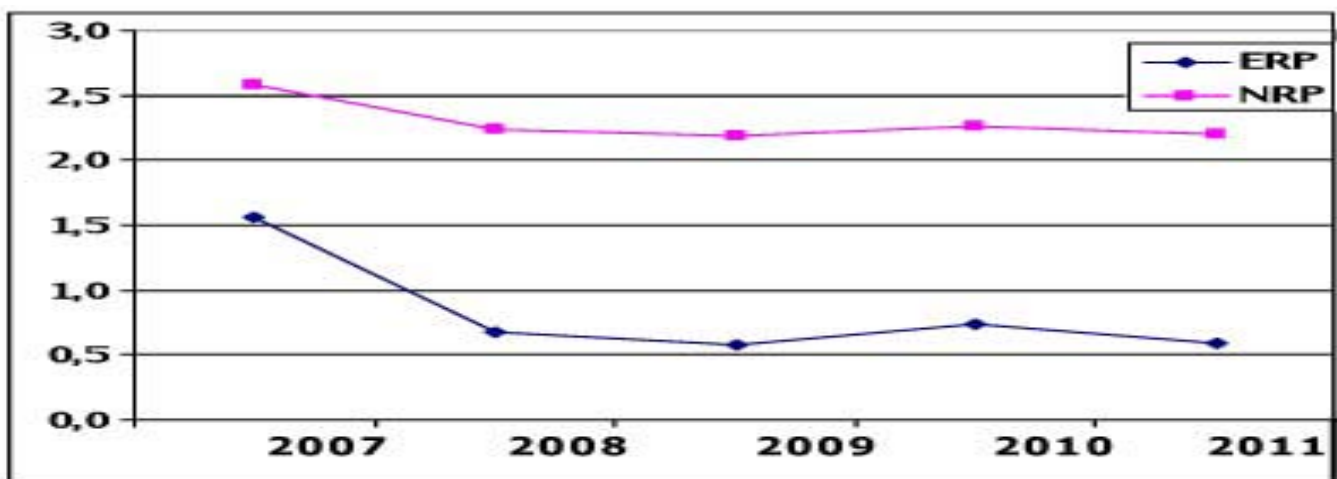
The region I (agriculture, forestry and fishery), in the period of 2005 - 2011, the ERP is always much lower than the real NRP, especially for agriculture and fisheries groups. At 2 periods (2005-2007 and 2008-2011), when Vietnam became a member of the World Trade Organization in 2007, it is surprising that at the previous period, the Vietnam's ERP tends to decrease, which is "very good" (effective rate of protection tends to approach the nominal rate of protection). But from 2008 to now, the effective rate of protection is getting far away

from the nominal rate of protection (Table 1). This result means that: "after Vietnam joined the World Trade Organization (WTO), the products of the region I are not protected and gradually lost comparative advantage". In the period of 2007 - 2011, the ERP decreased from 1.6% in 2007 to 0.6% in 2011, while the NRP decreased from 2.6% in 2007 to 2.2% in 2011. This is really "not good" as the ERP essence to equal the NRP (in fact, it should be much lower), but after 5 years of integration, this rate has decreased faster.

Table 01 : ERP and NRP of region I

	2005	2006	2007	2008	2009	2010	2011
Region I							
ERP	0.00642	0.0108	0.015656	0.00670	0.0057	0.00738	0.005868
NRP	0.02221	0.02394	0.025853	0.0223	0.02194	0.02259	0.021994
Deviation	-0.0158	-0.0131	-0.01020	-0.0156	-0.01621	-0.0152	-0.01613

Figure 02 : ERP and NRP of region I in the period of 2007-2011



Based on the Supply - Use Table (2010 updated version) and the actual nominal tax rate for the years 2007-2011, the research team calculated and

found that there are many sectors in the region I having very low effective rate of protection (ERP), even negative.

Table 03 : Sectors with negative ERP in region I (2011)

Sector	ERP
Sugarcane	-0,022327
Raw rubber	-0,005268
Other perennial plants	-0,010558
Buffaloes, cows	-0,015582
Pigs	-0,178821
Poultry	-0,066409
Other agriculture products; agriculture service	-0,084771
Round timber	-0,008056

Using I-O table in 2007, the research team calculated the index of the power of dispersion and the index of imported stimulation for 138 sectors in I-O 2007. If a sector has high index of the power of dispersion (more than 1), it will affect more to production than others. If the sector has the index of power of dispersion on import greater than 1, which means the more these sectors, developed the more import stimulated.

than 1 and the index of import stimulation less than 1 (Table 4). The index of the power of dispersion is greater than 1, which means that focusing resources on these sectors (production of livestock products, agricultural products, Fish farming, buffaloes, cows, pigs, poultry), will motivate, stimulate the development of other sectors. Other sectors mean sectors of processing agricultural products in the region II.

The result shown that in the region I, there are sectors with the index of the power of dispersion greater

Table 04 : The index of the power of dispersion and the index of power of dispersion on import of some sectors in region I

Sectors	The index of the power of dispersion	The index of power of dispersion on import
Buffaloes, cows	1.149	0.724
Pigs	1.794	0.752
Poultry	1.616	0.748
Other livestock and poultry, n.e.c,	1.591	0.747
Other agriculture products; agriculture service...	1.484	0.796
Fish farming	1.694	0.771

c) ERP and NRP of region II

Considering on region II in two periods (2005-2006 and 2007-2011), the fact showed that ERP of this region is quite good in the first period (ERP > NRP).

However, from 2007 onwards, the ERP is lower than the NRP. This is a paradox for Vietnam that "the more participated in the world economy, the worse protected for domestic production" (Table 05).

Table 05 : ERP and NRP of region II

	2005	2006	2007	2008	2009	2010	2011
Region II							
ERP	0.0593	0.0405	0.024695	0.0289	0.0281	0.0312	0.03288
NRP	0.0427	0.0379	0.033893	0.0349	0.0348	0.0356	0.03597
Difference	0.0167	0.0026	-0.009198	-0.0060	-0.0066	-0.0043	-0.00309

For an economy which contribution of the region II (industry and construction) accounts is nearly 42% of GDP in 2011 (as reported by the General Statistics Office), the ERP for the products of the region I is becoming less effective, it lead to effective production of region II also deteriorate. The reason is that region II is still mainly processing, processing industry group from

agricultural products does not take advantage of input domestic products, leading to import. Moreover, many sectors have "negative" ERP. This can be explained in part of the cause of trade deficit in 2011 still high, estimated to reach USD 9.5 billion USD, equaling 9.9% of total export turnovers (as reported by the General Statistics Office).

Table 06 : Sectors with negative ERP in region II (2011)

Sector	ERP
Rice	-1,112092
Flour (all kinds)	-1,255592
Animal feed	-0,959294
Costume (all kinds)	-0,052503
Leather, preliminary processed fur, suitcase, bags, Saddle and other same kinds	-0,003940
Paper and by-paper products	-0,004345
Other products extracting from oil gas	-0,040049
Basic organic chemicals	-0,040992
Fertilizer and nitrogen compound	-0,011071
Plastic and primary synthetic rubber	-0,012864
By-product plastic	-0,005861
Cell and battery	-0,009446
Electric conductor	-0,005663
Other transport means	-0,095013
Jewelry, false jewelry and related details; musical Instrument; fit tools, sports, toys, games	-0,195592

Typically, in region II there are three industries that the input products could use the output of the region I such as animal feed, rice, flours (all kinds). Three industries in the period from 2005 to 2011 have negative ERP; It means that effective protection of

domestic production of these industries does not efficiency, but only stimulated import of raw materials. Meanwhile, two other indexes are very good: The index of the power of dispersion is greater than 1 and the index of power of dispersion on import is less than 1.

Table 07 : The index of the power of dispersion and the index of imported stimulation of 3 sub-sectors

Sector	The index of the power of dispersion	The index of power of dispersion on import
Rice	1.535418	0.732655
Flour (all kinds)	1.479515	0.805157
Animal feed	1.636165	0.828221

An interesting thing in the case of study is that, some sectors have ERP lower than NRP (or even negative), it is necessary to review the tariffs of the products of these industries in order to protect domestic production. For example, these industries of processing costume (all kinds); Leather, preliminary processed fur, suitcase, bags, saddle and other same kinds; Other products extracting from oil gas; Basic organic chemicals; Fertilizer and nitrogen compound; Plastic and primary synthetic rubber; By-product plastic. However, we should consider the combination of the two indexes (The index of the power of dispersion and The index of power of dispersion on import), which shows that, focusing on the development of these industries is not good, because the index of the power of dispersion is lower than 1 and the index of power of dispersion on import is greater than 1. It means: *“if focusing on the development of these industries, they can not make motivation (the power of dispersion) for the development of other industries, at the same time, the more developed, the more imports”*



Table 08 : Some sectors have ERP <0; The index of the power of dispersion < 1; The index of dispersion on import > 1 (region II)

Sector	The index of the power of dispersion	The index of dispersion on import	ERP
Costume (all kinds)	0,8746	1,1232	-0,0525
Leather, preliminary processed fur, suitcase, bags, saddle and other same kinds)	0,9452	1,1761	-0,0040
Other products extracting from oil gas	0,7949	2,0652	-0,0401
Basic organic chemicals	0,9818	1,4339	-0,0410
Fertilizer and nitrogen compound	0,9926	1,4553	-0,0111
Plastic and primary synthetic rubber	0,9337	1,3382	-0,0129
By-product plastic	0,8113	1,1649	-0,0059

Another result of the study shows that in fact the region II, some sectors have ERP higher than NRP and they also have the good index of the power of dispersion (>1), but the index of dispersion on import is greater than 1 (it means that the more development these sector, the more stimulate import. It is not really bad if the import used for production serving for domestic final consumption, but not used for export; or sector groups with high brainpower, it must be import

and serve public purposes, social security. About manufacturing industries such as textile products or assembling electronic products ..., there is the main purpose of "import for export" only. Because the important inputs are imported with a high price, and then taking advantage of domestic cheap labor resources and low technology then exported back to the 3rd country.

Table 09 : Some sectors have ERP > NRP, The index of the power of dispersion > 1; The index of power of dispersion on import > 1 (Region II)

Sector	The index of the power of dispersion	The index of power of dispersion on import	ERP	NRP
Coal mining	1,042	1,058	0,0290	0,0203
Vegetable and animals oils and fats	1,102	1,276	0,3349	0,0657
Fiber (all kinds)	1,213	1,076	0,1089	0,0360
Textile products (all kinds)	1,203	1,070	0,3145	0,0670
Other chemical products; man-made fibers	1,030	1,201	0,0769	0,0338
Electronic device, computer and peripheral	1,327	1,024	0,1397	0,0121
Machinery & equipment used for broadcasting, television and Information activities.	1,055	1,025	0,0807	0,0399
Electric light equipment	1,009	1,117	0,0536	0,0342
Other electric equipments	1,120	1,065	0,3193	0,0622

However, in region II, the results of the study showed that there are some sector groups with good protection of domestic product and the index of the dispersion greater than 1, the index of dispersion on import less than 1. These sector with inputs are mostly agricultural - fishery products (the output of the region I). These are sectors which the policy makers and economic planners need to pay more attention, avoid status as sectors in the region I, lost the protection of domestic production and loss of competitive advantage.

Table 10: Some sectors have ERP > NRP, The index of the power of dispersion > 1; The index of power of dispersion on import < 1 (region II)

Sector	The index of the power of dispersion	The index of power dispersion on import	ERP	NRP
Processed, preserved meat and by-products	2,034	0,743	0,3348	0,0494
Processed preserved fishery and by products	1,713	0,782	0,3493	0,0875
Processed preserved fishery vegetables and fruit	1,516	0,848	0,6518	0,1665
Cocola, chocolate and candy, cake products from flour	1,430	0,911	1,4990	0,2384
Processed coffee	1,013	0,802	0,3858	0,2422
Other remaining food (macaroni, my yarn and same products; processed food: spices, sauce, vinegar, ferment beer)	1,421	0,904	0,5107	0,1157

For the remaining sectors in the region II, the results of the study showed that there is no sector reached two requirements of the index of the power of dispersion and the index of dispersion

on import. Calculation of 2 indexes for 16 combination sectors is showed in the following table:

Table 11: The index of power of dispersion and the index of power of dispersion on import

	The index of power of dispersion	The index of power of dispersion on import
Agriculture	1.0293	0.9643
Fishery	1.3505	1.0276
Forestry	0.8934	0.9959
Mining & quarrying	0.7774	1.0039
Food, beverage and tobacco manufactures	1.4492	0.9564
Other consumer goods	1.2093	1.3754
Industrial material	1.2644	1.3595
Capital goods	1.2475	1.3279
Electricity	0.7220	0.9011
Construction	1.1949	1.2884
Wholesale and retail trade	0.7303	0.9406
Transport services	1.0476	1.1619
Post and telecommunication	0.7748	0.9090
Finance, insurance, real estate, business services	0.7577	0.8853
Other private services	0.8133	0.9959
Government services	0.7384	0.9169

The result showed in table 11 indicated two sector groups with good index of power of dispersion (greater than 1) and the index of dispersion on import (less than 1), they are agriculture sector and processing product from agriculture sector which reach both requirements. They are priority sectors, which should be

protected and invested the most. Most of the manufacturing sectors have really high index of dispersion on import. These indexes of service sector are both low.

IV. CONCLUSION

ERP for domestic production of Vietnam after 5 years of joining WTO has not really reached the requirement, especially for manufacturing products should be protected in sector I. This issue needs the attention of the policy makers and economic planners. It implies that, those competing sectors were losing their competitiveness induced by protection policy of Vietnam. It leads to the processing industry group in sector II, which based on the input of sector I have to be imported and production efficiency will get more poorly.

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